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Standard 5.2D

Abby McElligott
University of Puget Sound

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How can I best utilize technology to further my students' learning in a variety of subjects without losing the lesson within the technology? Also, how can I make sure these experiences are meaningful and contributing to each student's technological proficiency?

The week before I was scheduled to begin teaching fulltime in my first grade student teaching placement, I was formally introduced to the potential chaos of every classroom. On the morning of the 100th day of school my mentor teacher was asked to substitute for another teacher in the building. Although she had planned on teaching the 100th day celebration, she and I were fairly confident that I could take over and execute all five of the stations she intended to set up on my own. However, between the calisthenics, finger painting, computer games, stamp books, and fruit loop necklaces I nearly lost my mind trying to regulate and assist and teach. The climax of my very adventurous afternoon was when Lily nudged me, elbow deep in bright orange tempera paint, and uttered rather nervously, "Um…Miss Hakanson, I think you should look at Tony." Terrified of what I was about to see, I spotted Tony across the room, quietly attempting to dismantle the classroom computer printer. When I asked him why he made this particular decision instead of solving computer math puzzles as instructed, he said, "I don't know…to see what's inside."

It took all my self-restraint to not break down into fits of laughter and tears in front of all my students right then, but in the end we all survived and the printer was returned to it's original state. This memory, however, stands out in my mind as my most

chaotic teaching day to date and my first encounter with six year olds and advanced technology. Clearly, Tony was simply trying to satisfy a curious itch to understand something foreign, and his actions, though somewhat out of the realm of the everyday, epitomize my experience with how the inclusion of technology in a lesson can overshadow the lesson itself. Because Tony was irresistibly interested in the inner workings of the computer printer, he was drawn away from the learning activities my mentor teacher had carefully planned.

Standard 5.2d states, "Informed by Technology. All students benefit from instruction that utilizes effective technologies and is designed to create technologically proficient learners." I understand this standard to mean that I both use technology to teach different subjects and, simultaneously, teach my students to be technologically competent. My personal philosophy is that the term "technology" applies to any and all physical tools which further student learning such as manipulatives, big books, or oil pastels. However, my impression of the state's use of this term is in reference to electronic technology only. Therefore, in keeping with my understanding of the state's intent in mandating the use of technology, I will use the word "technology" to mean electronic technology exclusively. My dilemma in relation to this standard, then, is finding ways to implement technology in a productive fashion that is appropriate for first graders and fosters technological proficiency without losing the lesson within the technology. How can I best utilize electronic technology to further my students' learning in a variety of subjects without losing the lesson within the technology? Also, how can I make sure these experiences are meaningful and contributing to each student's technological proficiency?

All of the students in my first grade classroom, perhaps most notably Tony, seemed to revere electronic technology with an all-consuming awe, excitement, and curiosity. The two forms of technology they were most commonly in contact with were computers and the document camera. Each presented unique challenges, although similar in how they affected lessons. However, for the purposes of this paper, I will be focusing on learning how to productively use computers in my classroom rather than examining both modes of technology. Two reasons dictate this decision. One, computers can be used for a variety of educational purposes whereas a document camera serves one basic purpose. Thus, I believe computers provide a wider range of learning possibilities that I could potentially tap into. Two, the document camera is a technological tool that I utilized while teaching, but the actual students did not use the document camera; it simply supplemented their learning. Each student did, however, use computers and will be expected to demonstrate some level of computer know-how throughout their schooling. In short, computers provide increased educational opportunities that I do not currently feel adept at exploiting for the benefit of my students' learning and individual technological expertise.

A number of issues arose in using computers as a learning tool. First on the list was availability. At the school in which I taught, each classroom was given two computers to keep for the year. In comparison to many schools or districts having computer access of any kind in individual classrooms may sound like a dream, yet I believe one computer per every ten students, as was the case in my classroom, is still insufficient. Thus, in my classroom, those two particular computers served two basic purposes: A.R. (Advanced Reader) tests and free choice activities. I never attempted an

actual lesson which required every student to use these classroom computers, nor did my mentor teacher, because of the constraints of time and practicality. Every time we discussed such a venture, we concluded that doing so would require us and our students to spend more energy worrying about the computers than achieving a more pertinent learning objective.

In order to teach whole class lessons using computers then, our class had to reserve the computer lab which had approximately twenty-five computers, enough for most classes to have one computer for every student. Because special education teachers were given priority and typically inhabited this room for their math instruction, only certain times throughout the week were available to regular classrooms. Furthermore, there was one computer lab for the entire school or one computer per fourteen students (which is likely more than some schools have), so everyone had to work around each other. In short, securing the computer lab presented challenges which prohibited implementing a unit over any length of time.

Once beyond the availability obstacle, many difficulties arose inside the computer lab. Because half of my class could not read, every in-lab lesson had to be whole group instruction, so that I could read aloud and provide clear directions for a portion of the time. I found it very frustrating that I had to teach these children how to use computers when this time could have been better utilized improving their reading skills. Perhaps if the computer lessons had furthered student understanding in another subject I would not have resented feeling obligated to use computers, but I did not see evidence of that amongst my students. Furthermore, first graders usually sit on a rug, six inches from the teacher, so as to avoid the distraction and confusion they encounter when spread out,

distraction and confusion that unavoidably took place when each student was seated at twenty different computers. Distraction was often a problem with especially curious or computer literate students; these students would begin exploring what was on their screen or press random buttons to discover their function and miss the mini-lesson entirely. Other students, once told to begin, would become overwhelmed because they could not find a button or somehow opened up the wrong window. Trying to help every student who needed me and ensure everyone learned something in the computer lab was daunting.

Buried within these problematic experiences is the fact that every student came to school with varying levels of computer knowledge and comfort. The majority of my students did have computers at home, so few of them approached computers with the same novel curiosity as Tony did during the 100th day of school celebration. He was not the only student that came to school with almost no computer skills or experience, though. Obviously, these students required more detailed instruction. Oppositely, other students were perhaps savvier than me, and still more resided somewhere in the middle. How can I negotiate all of these personal differences without boring the technologically advanced or losing the inexperienced? Although the challenge of balancing differences in student knowledge permeates all of teaching, it becomes a bit stickier when students can satisfy their boredom or confusion by simply pressing a button.

The final problem I ran into when trying to use computers was the types of lessons I could administer. Primarily, I was told, computers in the younger grades are used to introduce fun, interactive games/activities which teach math or reading skills. This is exactly how I used them. However, though I have no doubt that my students

benefited in these respective disciplines, I am not convinced they became any more computer savvy. Computers, thus, were a tool for instruction, but I cannot assert that my students' technological intelligence increased from these activities. Once my students reach second or fourth or ninth grade will the experiences I facilitated using computers in first grade be helpful or irrelevant? How can I teach students about the multidimensional function of computers if they only ever play educational games?

Washington state technology standards suggest that young students need to gain technological experience in more than simply games alone. For kindergarten through second grade students, the state has declared the following EALRs for student learning:

EALR 1: Integration-Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems.
EALR 2: Digital Citizenship-Students demonstrate a clear understanding of technology systems and operations and practice safe, legal, and ethical behavior.

Frankly, I am shocked at the breadth of experiences the state expects teachers to provide for their students. How exactly can I meet all of these goals? In first grade, a lot of my time was spent trying to teach students how to collaborate and communicate and solve problems. Would including technology in that equation make the concepts clearer or more challenging? Also, in order to properly meet EALR 2, I would have had to create lessons designed to teach my students about technology, not use technology to teach my students about another subject. I struggle to declare that I would have done this had I

known about these state standards because, in reality, I think there are more important concepts and subjects to teach in first grade. Do I want to take the time out of my already busy day to teach the ethical side of technology use? Honestly, no. However, I would like to learn how to use technology as a productive tool for improving student understanding in other disciplines. Can I do one without the other?

My interest in increasing productive computer use in class is amplified by the presence of visual learners in every class. During student teaching, I watched a few of my students make connections in math, that they had struggled with previously. For example, Quincy, a developmentally delayed student, had significant trouble understanding how large shapes can be broken down into smaller shapes on paper, yet he flew through computer programs designed to teach this concept. When we returned to class, he showed evidence of retaining this idea, no longer struggling to break down paper shapes or drawings. I loved seeing him make this connection, yet I still felt that the challenges and inefficiencies I saw in using computers very often outweighed the benefits. Some students gained very little from using computers because of their confusion and frustration. Overall, I felt the class did not learn enough in the subject being taught to justify regular computer use. Therefore, I wonder: in the future, how can I tip the scales so that the advantages always outweigh the difficulties and everyone benefits?

During student teaching, I used computer technology in math alone. Although there were programs set up to teach reading skills, I never used computers during reading group except for A.R. tests. I felt it was impractical considering the rigid time constraints of reading group and the requirements of the Read Well curriculum. Furthermore, looking back I realize that I only used computer technology in one math unit. This unit

was all about shapes. Students were expected to learn shape attributes and names, how to identify shapes in everyday objects such as a cereal box or chair, how larger shapes can be broken down into smaller shapes and vice versa, and the difference between two dimensional and three dimensional shapes.

The math curriculum my mentor teacher requested I use was Investigations. Basically, it is a very learner-centered curriculum that invites students to discover math through hands-on activities. I loved the variety of activities Investigations suggested. This curriculum provided opportunities for my students to explore the different objects in their classroom by measuring or weighing them, to learn about even and odd numbers by playing card games, or to understand graphing by making footprint charts. In short, it did not feel the need to veer far from the curriculum, mostly making a slight variation here or there.

Students spent a lot of time learning about shapes using manipulatives and different ordinary objects within the classroom. The majority of my students looked forward to these fun assignments and learned quite a bit. However, from what I saw, Investigations did not include whole class lessons using computers. Instead Investigations suggested that shape activities be available for student exploration during “choice time”. Choice time happened every Friday. Instead of teaching a full lesson, we would do Calendar and a math warm-up and then students could choose from an assortment of math activities that centered around what we had been learning throughout the week. The freedom choice time provided further encouraged self-exploration and allowed students to review content without any constraints or scary teacher expectations. A computer program entitled “Shapes” was an option during this time. However, because there were

only two computers, very few students actually used this resource in class. Typically, those students who felt confident in their computer skills dominated the computers with little competition. I did not pay a lot of attention to this phenomenon during student teaching, but now I realize that this imbalance simply expanded the gap between the technologically proficient and inexperienced. Had I noticed what was going on during my student teaching, I could have also identified some apparent patterns concerning who was typically more advanced, but looking back I cannot definitively say if such patterns existed or not.

Apparently my mentor teacher recognized the potential usefulness of computers more readily than I because midway through the unit she suggested I try a lesson or two in the computer lab. A lot of students were struggling with the idea of breaking down large shapes into smaller shapes and vice versa. “Why don’t you take the class to the computer lab? You can use that Shapes program. Maybe that will help them see what they are missing,” she said. I was happy for her input and open to anything, so we spoke with the special education teacher and found a date and time when we could have our first computer based lesson. I was a bit nervous, but the class was very excited when they heard. I made the mistake of announcing that we would be visiting the computer lab in advance and was consequently bombarded each day prior with questions and exclamations such as, “Is today the day we get to use computers?” or “Yay! It’s computer day!” followed by “Oh man, I wish we could go today!” Their enthusiasm was encouraging and a bit nerve-racking, and I believe it was a consequence of the novelty of the experience. If I had used computers as tools for instruction more regularly, I doubt my students would have maintained this level of excitement. At the time, I probably

realized how increased computer use would have changed their approach, yet I was not willing to discover just how true it was because of the obstacles I faced. Furthermore, would a less excited class necessarily be better or simply easier? Perhaps their excitement would have evolved instead of disappeared.

When the anticipated day finally arrived, we spent about fifteen minutes in our classroom discussing appropriate behavior in the computer lab. In my lesson plan, under the title "Learning Activties" (see McElligott-Artifact 5.2A), I wrote:

-talk with class about computer lab behavior (computer is expensive, not a toy, we are using it to learn, etc. etc.)

I believe an important part of learning about technology is learning to respect it and use it properly. Therefore, it was important to me to make sure I drove this point home with my students. By making it an enduring understanding, I hoped it would positively impact their encounters with technology in years to come. Also, I did not want a repeat of the 100th day of school incident! The discussion went very well, I thought. My students knew all of the right answers to my questions.

Me: Is the computer a toy?

Class: No.

Me: Are you allowed to do whatever you want on the computer?

Class: No.

Me: Why not?

Class: Because we are using the computer to learn about shapes, not play.

Clearly my students were well-rehearsed, but I was satisfied with their answers; at least I knew they had been listening.

We arrived at the computer lab and as soon as I opened the door, Lucy, Tony, and Mark (who were at the head of the line) broke into a sprint toward the first computer inside the door. Lucy was in front of the two boys and tripped about three steps in. She was almost trampled by Tony and Mark. Everybody froze, except for Lucy who was crying, more from fright and embarrassment than anything. Okay, I thought, I will just give them reminders throughout the class. I must anticipate student behavior. One little slip-up is no big deal. After making sure Lucy was okay, I asked these three students to please explain to the rest of the class why running was ABSOLUTELY NOT OKAY in the computer lab. “Because someone could get hurt,” Lucy said. “Yeah, and we might break something,” Mark said. Tony nodded his head in vigorous agreement, and I decided to ease up on my mean teacher stare and permit the rest of the class to enter. Poor kids, they were just excited.

Everyone filed into the computer lab silently and sat down at a computer. Perhaps the initial scare did them good, I thought. The next step, as listed under "Learning Activities", was for me to explain to the entire class exactly what they would be doing on the computers (see Artifact 5.2A). In my lesson plan, I wrote:

-briefly explain that they will be creating big shapes by dragging small shapes
into the big one on the screen

-once they successfully finish one, they can move onto the next

-repeat until time ends

Seemingly straightforward, I began relaying the aforementioned information. However, although the class was told beforehand to wait to begin until I was finished explaining and had answered any questions, Jason and Evan, two extremely computer literate boys who happened to be sitting next to each other, opened a completely different game and started playing. I did not realize what they were doing until Rachel yelled out, "Hey cool! Can we play that game too?" Of course Jason and Evan immediately shushed her and tried to click out of the game before I was able to see that they were the perpetrators. Unfortunately, neither of them could find the "Close" button, so they began panicking and started pressing all kinds of buttons. As I was making my way toward them, several students stood up and moved in their direction to see this great new game. "Let me see!"; "Hey, where did you find that?"; "Cool, let's play that instead." I whipped around and said, rather loudly, "Everyone, please return to your computers and begin the shapes program while I help Jason and Evan. Please DO NOT open anything except for the Shapes program. If we cannot follow directions in the computer lab, we cannot come to the computer lab!" I made my point. Everyone went back to their seats and began working.

Jason and Evan were on two completely different pages by the time I reached them. Because I am not very technologically advanced, it took the three of us about ten minutes to get back to the desktop. Perhaps if my skills were up to par, the lesson would not have continued to spiral downhill. We had a little chat about why their behavior was

inappropriate, and I asked them to begin “Shapes”. For a moment, I considered being rather punitive and making an example out of these two students, who definitely knew better, by not letting them use the computers at all. Maybe everybody else will follow directions if I don’t let them participate for not following directions. It took a moment, but I decided that this would foolishly limit the amount of learning taking place, merely punishing a couple of eager students-bad idea.

Thinking the lesson was finally on it’s way, I began circling the lab, checking on my students and watching them learn. I reached the last computer in the third row and noticed that Eve was very quietly crying into her hands. If anyone noticed before I did, they were probably scared to tell me at that point (sad, but true). I knelt down next to Eve, glancing at her blank computer screen. “Eve, what’s the matter?”, I asked. “I….I…I can’t find anything called shapes,” she whispered through her tears. Eve was a strong reader, so I knew that she would be able to read the program titles on her desktop without a problem. Just to make sure she was not simply overlooking it, I searched her computer and likewise found no such program. Perhaps I should have done a pre-lesson survey to make sure every computer had the program we were using, but I did not. I assured Eve that she was not in trouble, that I had made a mistake by giving her a computer without the program, and asked her to please team up with another student of her choosing since there were no more available computers. Although she quickly found a partner and they began happily working together, I worried that these two students were not being given the same experience as everyone else. Having to share the computer when every other student had their own, and we very rarely visited the computer lab, seemed unfair.

Wow, I thought, what else can go wrong? Only fifteen minutes remained in our

lesson, so I was hoping it would be smooth sailing from this point forward, but apparently I was being naïve. One of the virtues of this program is that it is self-paced, so as students finished they could begin the next module. Unfortunately, several students started calling out, “Hey So and So, I’m on number 6. What number are you on?” It became a race. Everyone wanted to prove that they were faster and smarter than their peers. “This is not a race,” I reminded them. “Please focus on your own screen. It doesn’t matter if you are on number one or number ten.” My comments waylaid their competitions for about five minutes before some could not hold back any longer. Again, half the class was shouting out their progress and inquiring into each other’s. Lily, normally very docile, could not take it any longer and yelled, “Shut up! She said it doesn’t matter! I hate this stupid program anyway!” and burst into tears. Ok, I thought, we’re done. Silenced by Lily’s unexpected outburst, the class willingly closed their programs and lined up as instructed.

We solemnly returned to class, and although I had an assessment planned, I decided then not to use it. Maybe tomorrow, I thought. I also considered having a class-wide discussion about what happened in the computer lab, but I decided against it. The disappointed, somber, and frightened looks on my students’ faces let me know that they were very aware that the lesson was not particularly successful. Instead, I chose to let them think about it a bit, and if someone else brought up the experience we would talk about it then. More than anything, I just wanted to move on.

I went home that night and thought about the computer math lesson. Why did so much go wrong? I wondered. What should I have done differently? We talked before! They knew how to behave! They’re good kids! I concluded that my students were simply

over stimulated and that being excited about a lesson is a good thing. Hopefully, my obvious frustration did not stunt their enthusiasm, and perhaps next time would be better.

While I was reflecting, I realized that I had no idea how much, if anything, my students learned about shapes. Did their understanding increase? Did using the computers help anyone? I could not answer these questions, so I decided that I would make it my mission to find out the next day.

The assessment I had originally planned was for students to return to the classroom and complete a paper worksheet which mimicked the computer activities. On my lesson plan, under "Assessment" (see McElligott-Artifact 5.2A), I wrote:

-have students fill out worksheet like computer problems-Can they do it on paper, too?

Rethinking my initial plan, I decided this assessment would not convey exactly what I wanted to know. Because of the events of the lesson, I was curious to understand how my students saw the lesson. What did they think was most important about it? What will they remember in the future? Math learning objectives or technology use? Now, I wonder if I was setting myself up for failure. I believed that my students had learned little about math, so I took away their chance to prove me wrong. Of course they would focus on the chaos; most days chaos is more fun. Anyway, to adjust, I put a line through my initial sentence and wrote (see McElligott-Artifact 5.2A):

-create a class list on board, have students tell me what they learned and assess

Because I wanted to sit down with their feedback after class, I asked my mentor teacher to record the responses student's came up with. Having my students tell me verbally what they learned would help me understand what my students learned about shapes and what they learned about using computers. Intentionally, I left the question very vague, curious how my students interpreted the lesson. On the board, I wrote, "In the computer lab, I learned…" Here are some responses (I did not record names next to answers) (see McElligott-Artifact 5.2B):

-not to run in the computer lab
-sometimes people get mad when you ask them what number they're on
-Miss Hakanson does not like it when we race
-there are a million gazillion ways to make big shapes with littler shapes
-how to make big shapes with baby shapes
-DO NOT press buttons on the computer when you don't know what they do!!!

My prompt was met with seventeen responses. Out of those seventeen, only five (29.4%) pertained to math or shapes. The other twelve were all about proper computer use and class disruptions. Did my students learn anything about shapes? Did this activity successfully bridge gaps in student thinking? Although those responses pertaining to math do suggest that some students made progress, now I wonder if the students who offered these responses were previously struggling with shape combinations or not. How much of a difference did computer use make? Did my restructuring of the assessment invite answers that prove to me that computers are bothersome and difficult to use?

Because my intention was to identify patterns in student learning with this chart, I deduced that the computers were more the focus than the math activity. The chaos and excitement of going to the computer lab stood out in my student's mind. I do believe that this shapes activity positively influenced some students. In fact, the special education teacher came and talked with me the next day about one student's, Quincy's, quick progress in understanding shapes in one day. I was very happy to hear this, yet I still did not feel confident that as a whole the class benefited in math. Furthermore, I cannot say that they became more technologically proficient either. Their entire experience included clicking on one icon and completing a math activity that only involved dragging shapes. Besides learning how to use a mouse, a skill all of my students appeared to have already mastered, they did not develop any more technological skills. Therefore, my approach to implementing technology productively produced less than desirable results. Again I wonder, how can I alter my methods to promote technological proficiency and learning in a variety of different subjects?

Reflecting on my use of technology during student teaching has forced me to admit that I did not benefit from implementing it because I did not want to. I felt obligated to use computers to meet state standards, but I did not then, nor do I now, believe that first graders need computer lessons more than they need reading, math, science, writing, or art. Thus, I was not willing to take time away from these other areas to teach technology. As previously mentioned, I believe technology is more than just electronic technology, yet I do not feel this sentiment is prevalent or condoned by the state. Therefore, I conformed to my understanding of their requirements as minimally as

possible. Ultimately, this resulted in lessons which failed to truly meet any learning objectives, technological or otherwise.

Part of the problem I now see with my use of technology in the classroom was my resistance to including technological learning objectives in my lesson plans. I wanted to use technology to supplement other learning, but I did not acknowledge that technology use must also be purposefully taught in order to serve another purpose. Wiggins and McTighe (1998) propose that in order to effectively reach learning goals, teachers must implement the principles of backward design. They describe this process as follows, "One starts with the end-the desired results (goals or standards)-and then derives the curriculum from the evidence of learning (performances) called for by the standard and the teaching needed to equip students to perform" (p.8). Therefore, instead of telling my students exactly which button to push when and setting them loose on the designated computer program, I should have first figured out how I wanted technology to serve my students and what they needed to know when using computers to reach those goals. Perhaps it would have been even more useful to take the time to teach lessons which focused on the proper use of computers alone. These could have been short and concise. In fact, I might have been able to set up some station activities in which students took turns on the classroom computers, learning how to use them before going to the computer lab.

I have also come to realize that my irritation with teaching technology does not negate the fact that I have to teach children how to use it in order to meet state standards and the ever-growing demands of a technologically driven society. Therefore, if I am to accept my responsibilities as a teacher, I must acknowledge all of them and aim to teach

technology use as well as use technology productively. The two cannot be separated. I wonder, though, if electronic technology use will always take center stage or if other forms of technology will be similarly valued in education. If the former is true, will this cripple future generations? Will students become overly reliant on technology? What about the kids who do not have a computer at home? Perhaps these questions suggest that I am still fighting technology, yet I believe it is important to be aware of the potential pitfalls of technology as well as the benefits. Computer technology can be dangerous, but I realize now that that is all the more reason to teach students how to use it properly and purposefully.

Reference:

Wiggins and McTighe (1998). Understanding by Design. Alexandria, Virginia: Association for Supervision and Curriculum Development